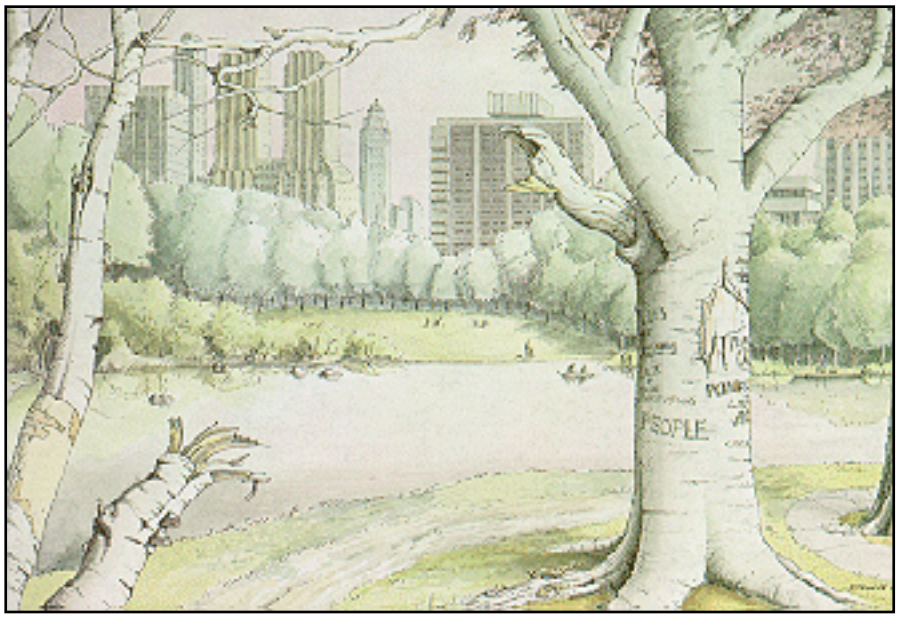
YOUR TREE'S TROUBLE MAY BE YOU!



FOREST SERVICE, U.S. DEPARTMENT OF AGRICULTURE

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Please be advised that this is an older publication

TREES
are some of our best friends

TREES
provide shade, beauty,
homes for wildlife, wood products, paper
and many other
BENEFITS.

TREES
provide these benefits
ONLY
as long as they are
HEALTHY.

"Your Tree's Trouble May Be You!" is a companion to "A Tree Hurts, Too". They are part of a Forest Service, U.S. Department of Agriculture program designed to provide information on the wise use and care of trees...some of our most versatile and renewable natural resources.

This booklet was prepared by tree specialists in the Northeastern Area, State and Private Forestry from information developed by research scientists at the Northeastern Forest Experiment Station. Both units are headquartered in Upper Darby, Pennsylvania.

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WOODSY SAYS:

Trees are for our use--not abuse.

Forest Service, U.S. Department of Agriculture

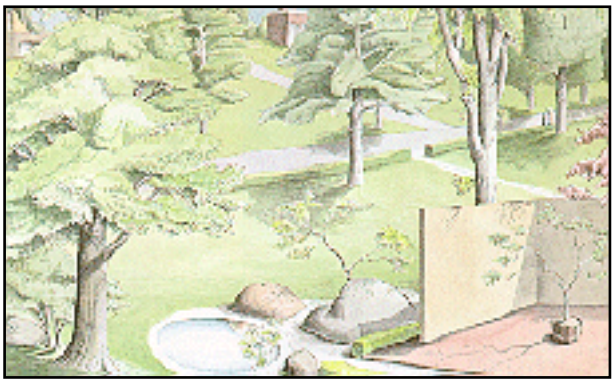
YOUR TREE'S TROUBLE MAY BE YOU!

People spend much time, effort and money to plant and maintain trees around their homes, businesses, public buildings and parks. People are attracted by the scenic and recreational qualities of forest environments. Yet people who love trees the most may unknowingly cause them injury, directly or indirectly, as a result of:

- Building and road construction
- Flooding
- Soil compaction
- Air pollution
- Lawn and garden equipment
- Lawn and garden chemicals
- Deicing salt
- Wounds
- Improper pruning
- Improper planting

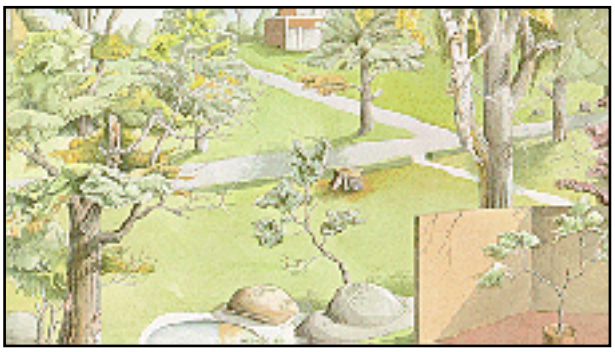
These are major people-caused tree injuries. Be aware of them and of some prevention and treatment methods that can be used to *help your trees be healthy*.

Arborists, nurserymen, state service foresters, extension foresters and municipal foresters can provide more information and/or technical assistance.



Healthy trees add beauty to our homes and parks. They make our world a more pleasant place in which to live.

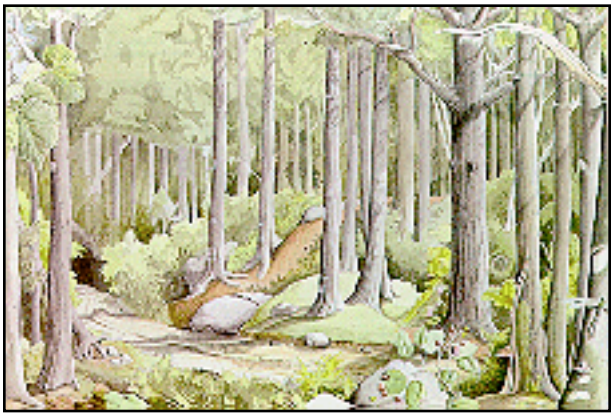
Healthy trees help cool and clean the air, deaden sound, provide shade and add beauty to our urban environments.



Unhealthy trees endanger and detract from our homes and parks. They make our world a less pleasant place in which to live.

Unhealthy trees do not enhance and protect our urban environments.

BUILDING AND ROAD CONSTRUCTION INJURES TREES



Wooded area before house construction.

Trees, like people, are easily disturbed by changes in their surroundings. Construction of buildings and roads is a major cause of tree injury.

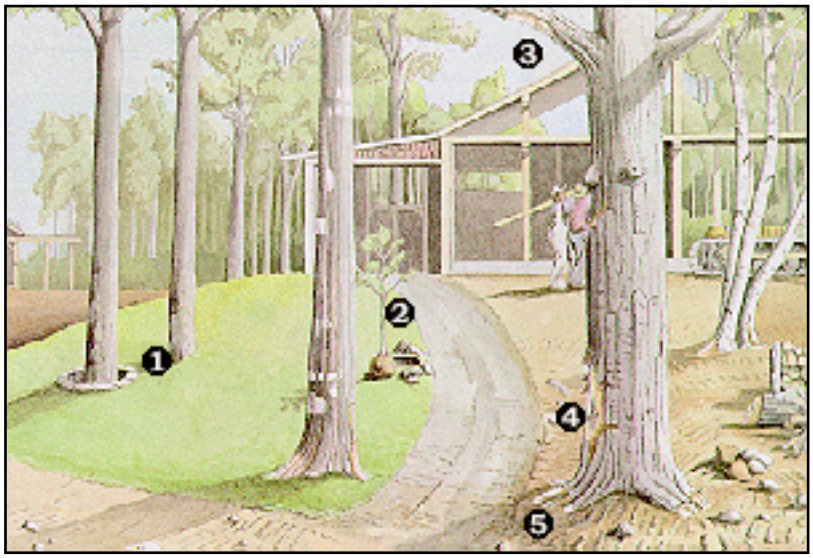
Symptoms of tree disease may not be immediately visible. Sometimes several years of decline occur between injury and death. Trees are often injured by earthmoving equipment and by changes in ground level. Roots can be injured when heavy equipment passes over them. Ditching along highways and in building projects can also injure trees. Root injury- not trunk injury- during construction is most likely to kill trees.

The addition of asphalt, concrete, bricks, or more than a few inches of soil around trees will change the amount of water and oxygen available to their roots. Trees with roots so covered have trouble "breathing" and may die within 3 to 5 years. The construction of a small well around the trunk of an established tree may not always protect it.

A young tree planted in a large well can adapt to living in a well and will usually grow to maturity. When young trees are to be planted within large paved areas- such as parking lots or pedestrian plazas- they should be planted in large wells that have been carefully planned and constructed. Trees should not be planted until all construction has been completed.

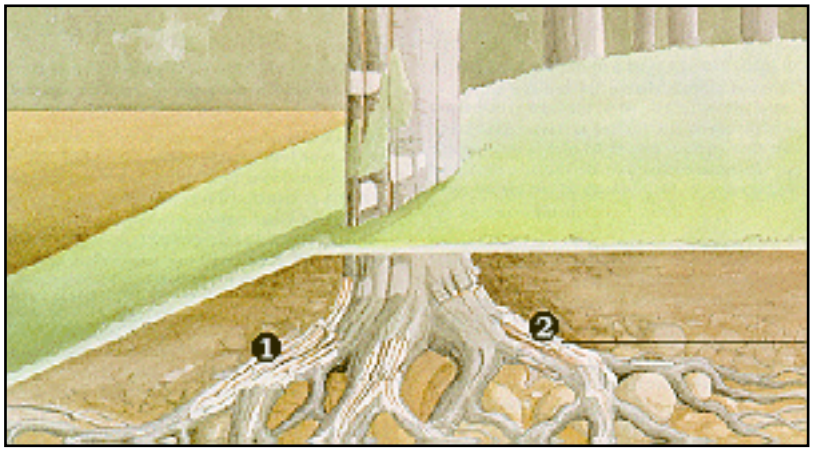
Prevent damage to trees near construction sites by fencing or otherwise protecting them from earthmoving equipment. Caution construction workers to be very careful when working close to

trees. If possible, avoid adding excessive soil or impervious materials within the drip line (entire area under branches) of a tree. A retaining wall outside the drip line will often eliminate indiscriminate fill over roots.



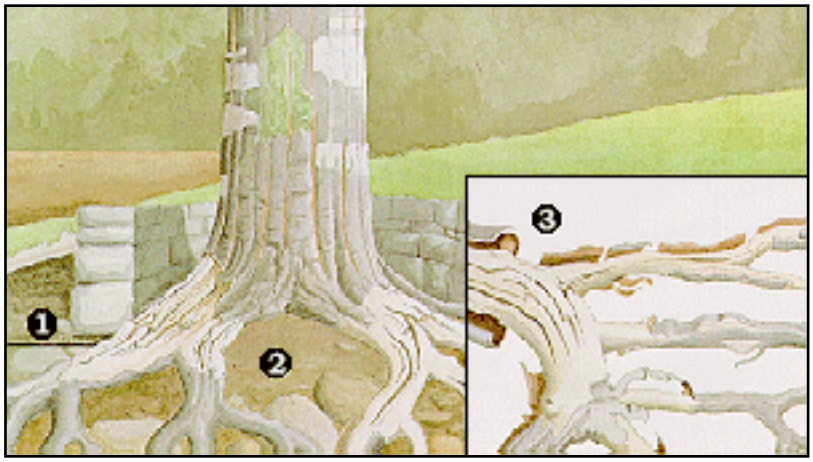
1. Excessive landfill
2. Tree planted too close to driveway
3. Branch wound
4. Trunk wound
5. Root wound

The same wooded area during house construction. Careless construction can severely damage or destroy trees and other ground cover.



1. Buried injured roots
2. Original ground line

Landfills around trees cause root injury and restrict the flow of air and water within the soil.



1. Original ground line
2. Buried injured roots
3. Root injured during construction

Landfills injure established trees even when wells are constructed.

FLOODING INJURES TREES

Changes in normal drainage patterns as a result of construction may cause localized flooding. Prolonged flooding or inundation may kill trees, especially during the growing season. Flooding has an effect similar to that caused by covering roots with excess soil, asphalt, or concrete: the roots are deprived of oxygen. Low areas where flooding may occur are poor sites for some species of trees, while other trees thrive in wet locations.

Avoid any change in normal drainage patterns that will cause water to back up or pool over tree roots.

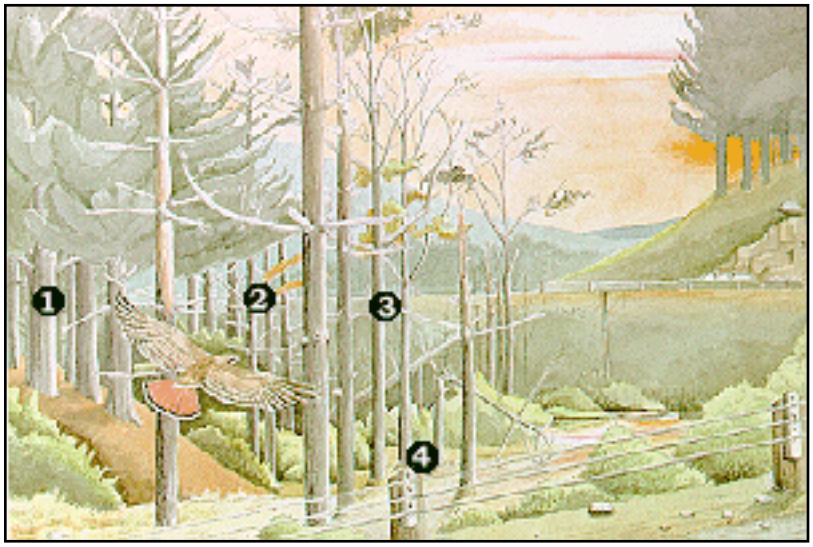
These trees are *relatively tolerant of flooding* and can be planted in low, wet places:

- ASH
- BLACK GUM
- COTTONWOOD
- ELM
- LOBLOLLY PINE
- OVERCUP OAK
- RED MAPLE
- RIVER BIRCH
- SILVER MAPLE
- SWEETGUM
- SYCAMORE
- WHITE CEDAR
- WILLOWS

These trees are *relatively intolerant of flooding* and should not be planted in low, wet places:

- HEMLOCK
- PAPER BIRCH
- PONDEROSA PINE
- RED CEDAR
- RED PINE

- WHITE PINE
- WHITE SPRUCE



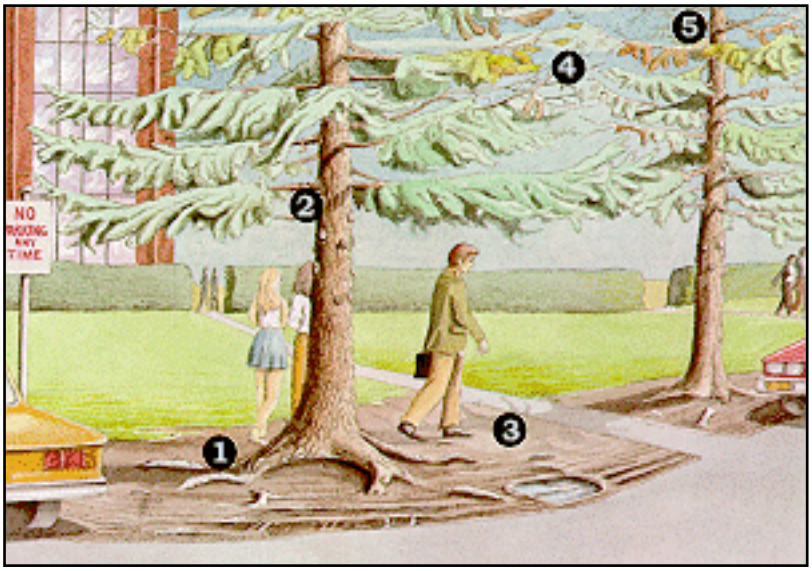
1 Healthy trees
2. Dying trees
3. Dead trees
4. Flooded area

Prolonged flooding may kill trees.

SOIL COMPACTION INJURES TREES

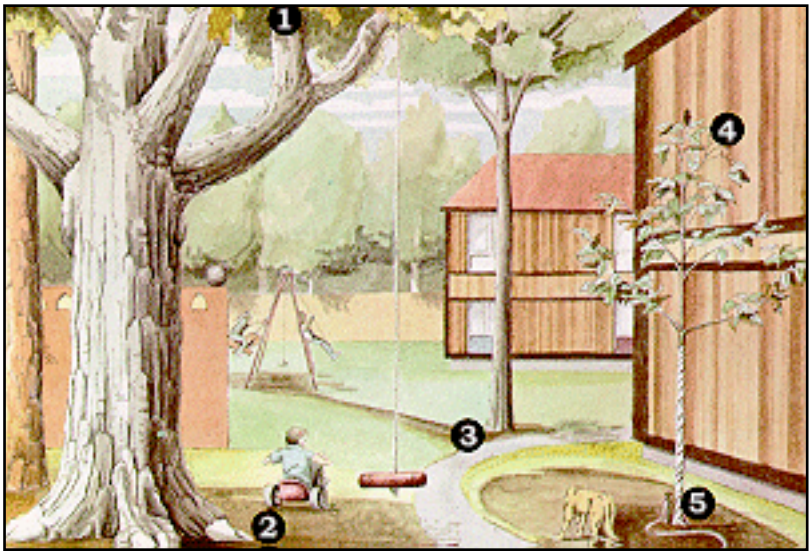
Soil compaction around trees is often caused by people, pets, bicycles and cars in parks and other recreation areas as well as in heavily used areas surrounding public buildings, business centers and multi-unit residential dwellings. Injured, exposed tree roots are hazardous to trees and people.

Compacted soil cuts off water and oxygen to tree roots. Dying leaves on mature trees and dying branches on young trees may indicate compaction injury. Pedestrian and other traffic patterns should be designed to help prevent soil compaction. Public cooperation and respect for trees are also needed.



Soil compaction near a major public building.

1. Injured, exposed roots
2. Poorly healed branch stub
3. Compacted soil
4. Dead branch tips
5. Dead tree top: a hazard



Soil compaction near an apartment complex.

1. Dying leaves
2. Compacted soil and root wounds
3. Path too close to established tree
4. Dying branches
5. Young tree planted too close to path

AIR POLLUTION INJURES TREES

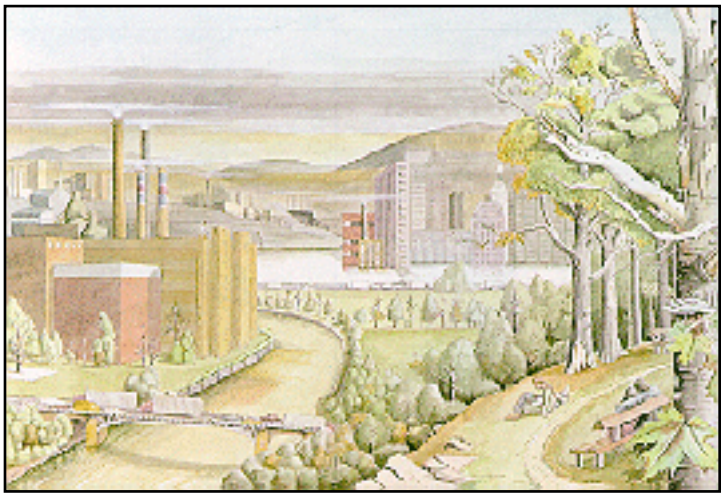
The main gaseous air pollutants that injure trees are sulfur dioxide, fluorides, and oxidants.

Sulfur dioxide comes mostly from burning coal and oil to generate electricity. It also is produced in smelting ores that contain sulfur and in manufacturing sulfur products.

Fluorides are produced by processing aluminum ore, manufacturing phosphate fertilizer and processing stone.

The oxidants are formed in the atmosphere from chemical reactions powered by sunlight. The oxidants that cause the most tree damage are ozone and PAN (Peroxyl Acetyl Nitrate). They are produced mostly from industrial and auto emissions, and they are common components of smog. Low concentrations of ozone also occur naturally in the atmosphere.

The most serious forms of air pollution are difficult to prevent without a community effort. Contact local environmental agencies and citizen groups to offer your help. Minimize the air pollution you produce by keeping your automobiles tuned, limiting your use of internal combustion engines, and obeying local open-burning ordinances.



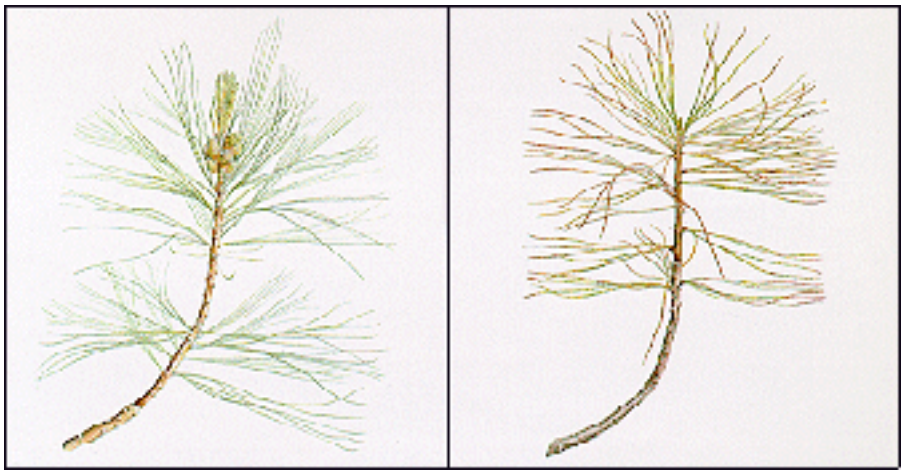
Air pollution damage to trees is most common around large cities, but it can also be seen in rural areas.

These trees are *relatively tolerant to common air pollutants*:

- ARBORVITAE
- BOXELDER
- DOUGLAS-FIR
- ENGLISH OAK
- MAGNOLIA
- NORWAY MAPLE
- RED OAK
- WHITE DOGWOOD
- WHITE SPRUCE

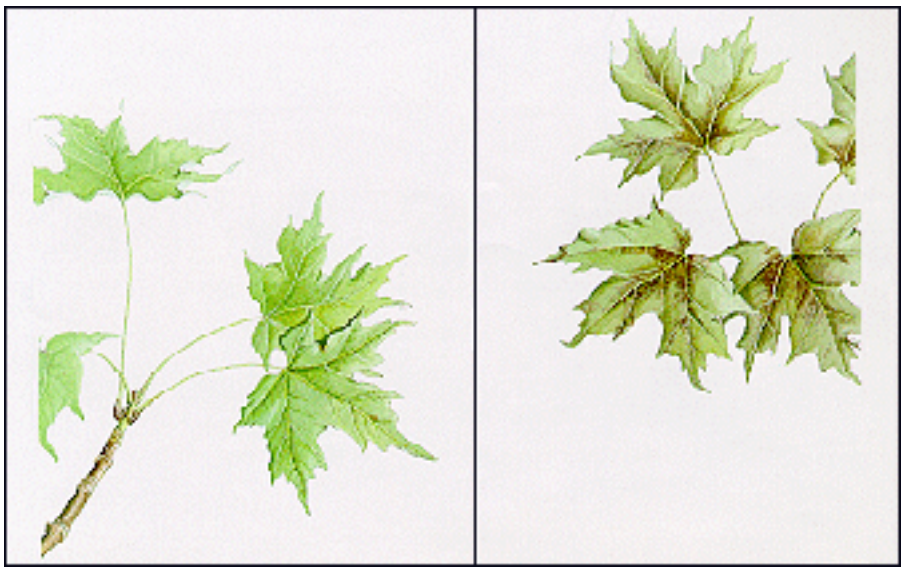
These trees are *relatively intolerant to common air pollutants*:

- AMERICAN ELM
- CATALPA
- JACK PINE
- LARCH
- LOMBARDY POPLAR
- PONDEROSA PINE
- QUAKING ASPEN
- VIRGINIA PINE
- WHITE PINE
- WILLOW



Healthy pine needles.

Pollution-injured pine needles. Green and brown bands on pine needles indicate air pollution damage.



Healthy maple leaves.

Pollution-injured maple leaves. Discoloration along the midrib of hardwood leaves may indicate air pollution damage.

LAWN AND GARDEN EQUIPMENT INJURES TREES

Lawnmowers, snowplows, and other lawn and garden equipment can severely injure trunks, branches and roots of trees. These injuries van be as serious as those caused by heavy construction equipment.

Be careful not to run into your trees with lawn and garden equipment.

To prevent accidentally injuring young trees with lawn mowers, grass should be kept away from the tree trunks. You may wish to keep the grass pulled or to remove the sod. Don't use chemicals to kill the grass!

LAWN AND GARDEN CHEMICALS INJURE TREES

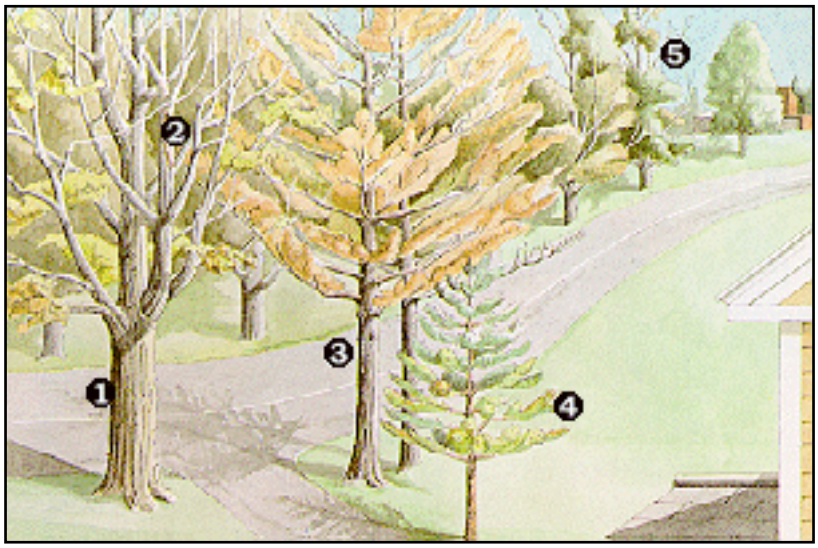
Fertilizers and pesticides can either help or harm your trees. It all depends upon how and where you use them. Beware of the philosophy that "if a little is good, a lot will be better".

Herbicides (weed killers) can kill your trees. Even when herbicides are properly applied the chemicals may drift through the air and injure non-target plants. Avoid excessive use of commercial fertilizer-herbicide mixtures near trees, because toxic amounts of herbicides may be absorbed by tree roots. Recently transplanted trees are especially susceptible to herbicide injury.

Be careful in your choice of lawn and garden chemicals, and use them ONLY in the precise manner recommended on the label.

DEICING SALT INJURES TREES

Deicing compounds used on highways, driveways and sidewalks in winter contain sodium chloride (table salt) and/or calcium chloride. These chemicals are toxic to trees. Roadside trees are injured when salt is absorbed by their foliage and roots. Avoid or minimize the use of salt around your trees.



1. Mature sugar maple too close to road
2. Advanced decay in roadside trees is a safety hazard
3. Young white pine too close to road
4. Salt-injured red pine
5. Dying branches as a result of salt injury

Salt spray from roads can seriously injure trees. Dying branches on roadside trees are early signs of salt injury.

Salt injury on pine needles...and maple leaves.

Uniform browning of needles indicates salt injury.

Dry, brittle leaf edges often indicate salt injury.

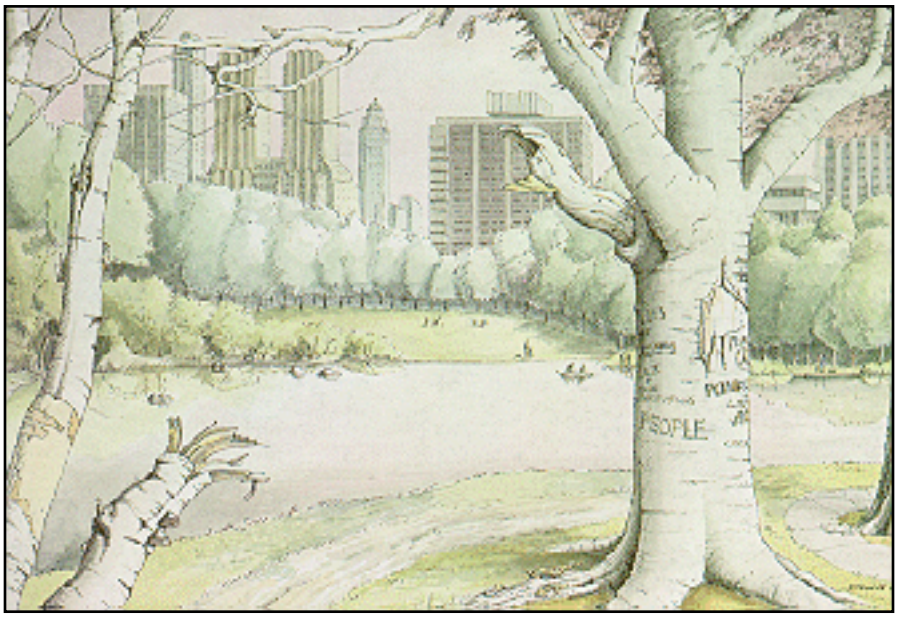
These trees are *relatively tolerant of salt spray* from traffic or saltwater runoff:

- AUSTRIAN PINE
- BIG TOOTH ASPEN
- BIRCHES
- BLACK CHERRY
- BLACK LOCUST
- QUAKING ASPEN
- RED CEDAR
- RED OAK
- RUSSIAN OLIVE
- WHITE ASH
- WHITE OAK
- WHITE SPRUCE
- YEWS

These trees are *relatively intolerant of salt spray* from traffic or saltwater runoff:

- BASSWOOD
- DOUGLAS-FIR
- HEMLOCK
- IRONWOOD
- PONDEROSA PINE
- RED MAPLE
- RED PINE
- SHAGBARK HICKORY
- SPECKLED ALDER
- SUGAR MAPLE
- WHITE PINE

WOUNDS INJURE TREES



Vandalism injures trees and mars their beauty.

Wounds commonly occur on the exposed parts of trunks and roots. Although tree wounds are often caused by the forces of nature, people are also responsible for many root injuries, bark injuries and broken limbs. Unfortunately, some people enjoy carving designs and words into the bark of living trees. These carvings mar the tree's beauty and open its trunk to invasion by a variety of microorganisms. Trash fires or campfires built against the trunk of a tree cause injury and may kill the tree.

Improperly treated wounds are often followed by decay. Wounds should be treated by removing dead and torn bark tissues and by shaping the wound into a vertical oval. This will help the tree to quickly heal its wounds. Commercial tree dressings such as orange shellac or those with an asphalt base can be painted over the treated wound. However, no dressing will always prevent decay.

Properly cleaned and shaped wounds help prevent tree decay.

1. Deep trunk wound on cherry tree
2. Trim away loose bark around wound. Shape wound. Make a clean edge between vigorous bark and exposed wood. Use a *sharp* knife.
3. Wound is healing through callus formation. Help tree maintain its vigor and protect it from further injury.

IMPROPER PRUNING INJURES TREES

Improper pruning is often followed by disease or decay. Pruning cuts should be made flush to the trunk or connecting branch. Branch stubs permit invasion by decay-producing organisms. Remove injured or diseased branches before they die.

Improper pruning does more harm than good.

1. Dead branch
2. Dying branch
3. Stubs too long
4. Serious wound from improper pruning
5. Long stubs delay healing
6. All wounds invite decay

Proper pruning helps assure long-lived, healthy trees.

1. Dead branch
2. Dying branch
3. Properly pruned dead branch

PROPER PRUNING STEPS

4. Undercut to prevent limb breakage
5. Cut down to first cut and remove branch
6. Trim branch stub flush with trunk

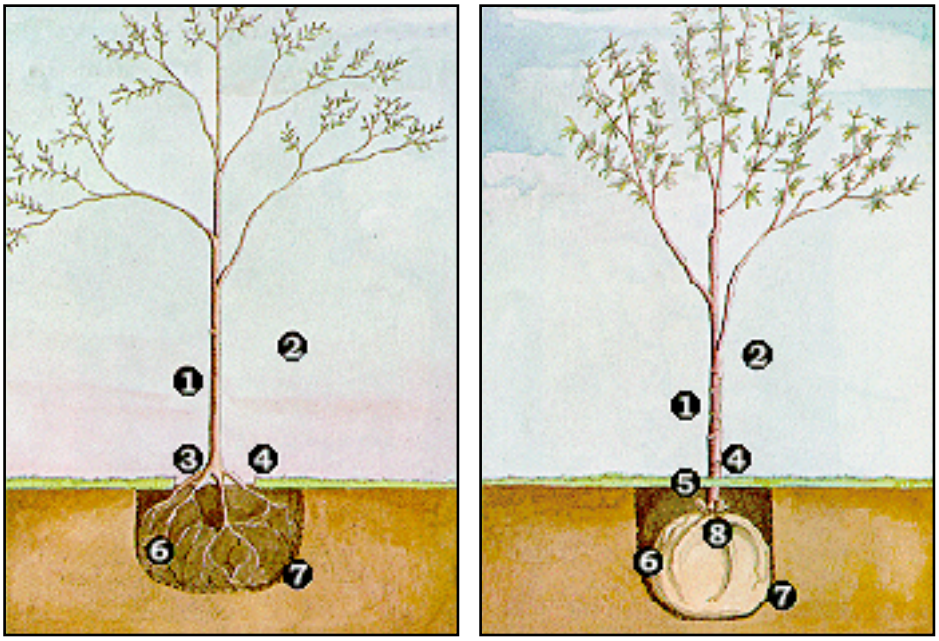
7. Branch stubs are healing through callus formation

IMPROPER PLANTING INJURES TREES

Correct planting techniques will help insure the survival of newly planted trees. Consult an arborist, nurseryman, state service forester, extension forester, or municipal forester about specific planting guides. Here are some basic guides for successful tree planting:

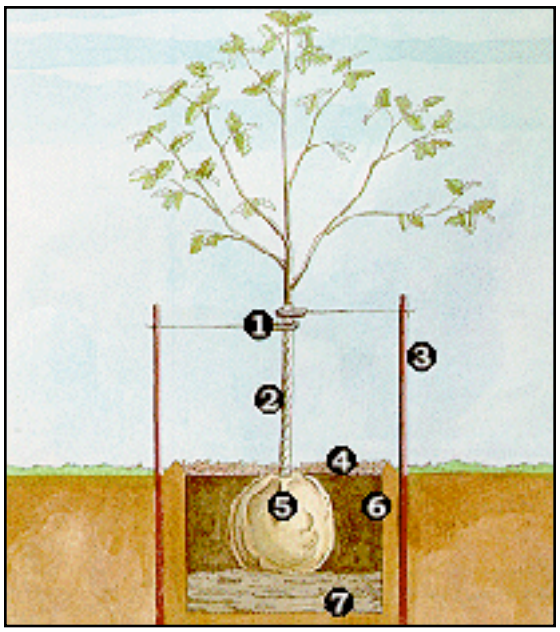
1. Plant during early spring or fall depending on the best time for the particular tree species.
2. Dig planting holes wide and deep enough to accommodate bare-rooted trees without cramping the roots. Holes for balled root stock should be at least 12 inches wider than the diameter of the ball.
3. Remove any plastic wrapping from balled root stock. Burlap wrapping should be loosened. Prevent tree roots from drying out before planting; protect them from sun and wind.
4. After placing the tree in the hole, spread the roots evenly and avoid damaging them. Tamp and water the soil carefully around the roots. While filling the hole with topsoil, cover the roots to the depth they were covered at the nursery.
5. Water immediately after planting, and continue to water periodically for 2 years. Water heavily near the roots about once a week fro several hours during the growing season and well into the fall. The soil should be saturated but not waterlogged (flooded).
6. Do not fertilize the tree at planting time because the fertilizer may "burn" the roots. Recommended fertilization practices vary greatly depending upon the kind of tree, local soil conditions and time of year.

When planting trees more than 3 feet tall, additional precautions are advisable. To help support the trees until their roots become firmly established, rubber-wrapped guy wires can be connected from the tree to supporting poles. These supports should be left in place for 1 to 2 years. Damage from sunscald (killing of tender bark by direct sunlight) and minor wounds can be prevented by wrapping bare trunks with burlap or creped kraft paper. Chicken wire supported by stakes around the tree will help prevent animal damage.



1. Tender bark exposed to sun
2. No supports provided
3. Roots exposed; tree planted too shallow
4. Sod replaced too close to trunk
5. Tree planted too deep
6. Roots crowded; poorly prepared hole
7. No loose fill or humus in bottom of hole
8. String on burlap ball not loosened

Improperly planted trees frequently die.



1. Rubber protective covers on wires
2. Wrapping for protection from the sun
3. Supports
4. Mulch rather than sod
5. String on burlap ball loosened
6. Properly prepared hole
7. Humus or loose fill

Properly planted trees provide many benefits for you and others.

Remember, PREVENTION is the best SOLUTION to tree disease PROBLEMS. YOU can PREVENT tree injury and disease by AWARENESS, CONCERN, and POSITIVE ACTION. HELP YOUR TREES BE HEALTHY TREES. DON'T LET YOUR TREE'S TROUBLE BE YOU!

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